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PLEASE RETURN

PRELIMINARY ENVIRONMENTAL REVIEW

for the

Proposed Expansion of Western Energy Company's

Rosebud Mine

In Area E

Rosebud County, Montana

Montana Department of State Lands
Helena, Montana
October 20, 1976

Submitted pursuant to
Montana Environmental Policy Act
Section 69-6504(b)(3)

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I. INTRODUCTION

On March 5, 1976, Western Energy Company (WECo) submitted an application to the Department of State Lands (DSL) to amend the 1973 and 1974 Surface Mining Permit for their Rosebud coal mine. WECo seeks to expand their strip mining operation in the Area E portion of their Rosebud Mine (figure 1). On June 14, 1976 DSL indicated that WECo's application was incomplete (see Appendix A).

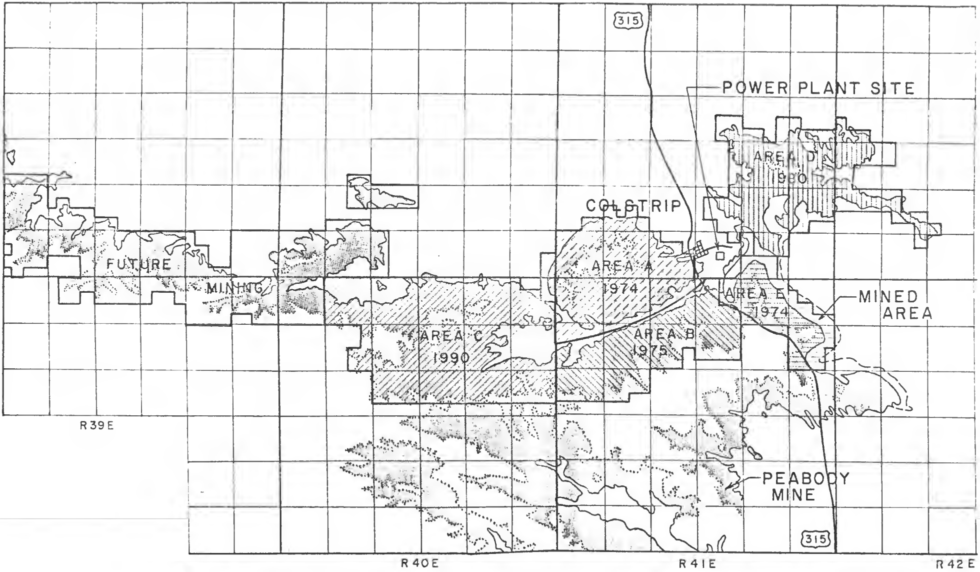
Because of: (1) the extensive time-period required for DSL to analyze a permit application on previously unpermitted acreage and (2) the fact that the March 5th application proposed the displacement of overburden an areas of unleased federal coal, WECo submitted a revised Area E amendment application on September 24, 1976. In this amended application, WECo is seeking approval to strip mine 324 acres previously permitted and bonded at the "associated disturbance" level.

The application does not include new acreage for roads, rails or facilities, nor does it contain new acreage for associated disturbance. Furthermore, the application does not include any of the unleased federal coal at the mining level. A permit map is included on page 3.

Area E of WECo's Rosebud Mine was previously discussed by DSL in November, 1973 in a draft Environmental Impact Statement.[1/] Subsequent environmental reviews for Area E were prepared by DSL in 1974[2,3/] and 1975.[4/] Area E will be discussed as a site-specific portion of the regional EIS for the Northern Powder River Basin. This EIS is currently being jointly prepared by the U.S. Department of Interior and by the State of Montana.

II. LEGAL CONCERNS

The Department of State Lands (DSL) administers the Montana Strip and Underground Mine Reclamation Act (Title 50, Chapter 10, R.C.M. 1947). The Reclamation Act specifies



COLSTRIP COAL DEPOSIT—ROSEBUD SEAM

(MATSON & BLUMER 1973)

Source: Montana Department of Natural Resources and Conservation, 1974, Draft EIS on Colstrip Electric Generating Units 3 and 4, 500 kilovolt Transmission Lines and Associated Facilities, Helena, Montana, Volume 3A, p. 258.

N

- Limit of Rosebud

- 150 Ft. Overburden Limit

Figure I

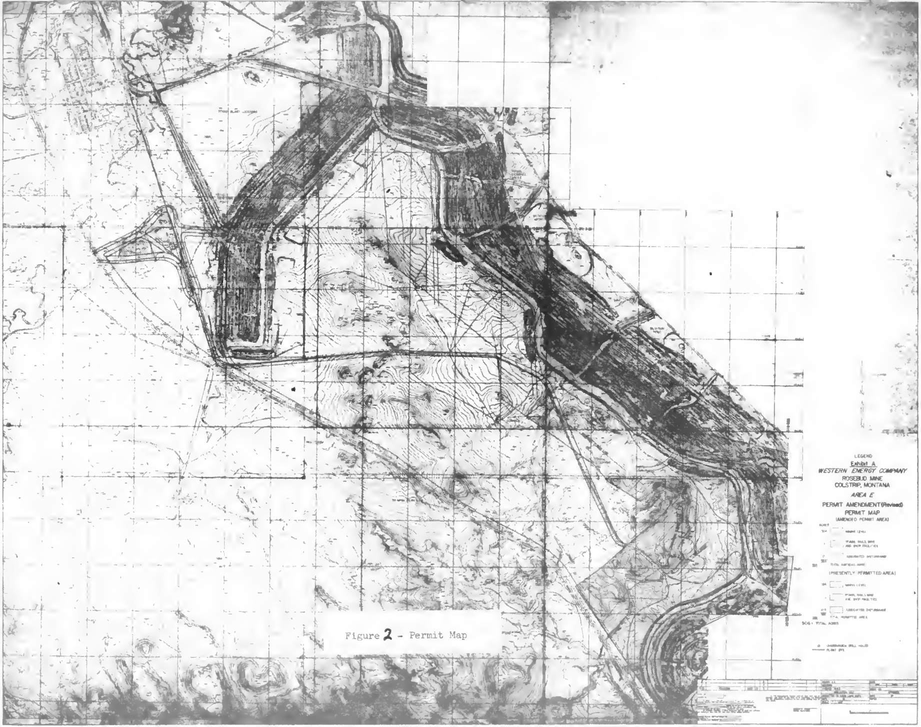


Figure 2 - Permit Map

that, "An operator may not engage in strip or underground mining (for coal or uranium) without first having obtained from the Department a permit . . . ." (Section 50-1039). Strip mine permits are issued for one year at a time and may be renewed annually upon application to the Department. Permit amendments may also be issued, however, when permit acreages are increased the period for which the initial permit was issued is not extended. Also, permit amendments have the same operator application and Department review requirements as do original permits.

Rules implementing the Montana Environmental Policy Act require that a Preliminary Environmental Review be prepared on certain departmental actions in order to determine whether they will have a significant effect on the human environment (MAC 26-2.2(18)-P280). If such a significant effect is determined a draft environmental impact statement will be prepared.

III. LOCATION

The community of Colstrip is located in Rosebud County, 45 miles south of Forsyth. Access is via federally assisted secondary Highway 315. Colstrip is surrounded by WECo's Rosebud Mine (figure 1). For management purposes, the Rosebud Mine has been divided into areas A, B, C, D, E, and Pit 6. Area E (figure 2) presently includes parts of Sections 1, 2 and 12, T1N, R41E and Section 35, T2N, R41E. Mining would be expanded in these sections (figure 2).

IV. HISTORY OF THE ROSEBUD MINE

The history of the Rosebud Mine is discussed in DSL's Final EIS for WECo's proposed expansion of the Rosebud Mine into Area B[5/] (July, 1976). This Section of the final EIS is incorporated by reference into this PER.

V. MINING PLAN[6]

The first step of the proposed mining operation would be to strip topsoil with scrapers and stockpile the material in designated areas. If wet conditions prevail crawler tractors would be used instead to remove the topsoil.

After topsoil is stripped a Bucyrus-Erie 1050 shovel would begin to remove the underlying overburden material. This would be placed in an existing cut originally opened by the Northern Pacific Railroad's coal mining operation. Where overburden exceeds 65 feet in depth above the top of the Rosebud Coal seam, scrapers and dozers would be used to complement the stripping operations of the Bucyrus-Erie shovel. Periodically a Marion 360 dragline would also be used to move overburden.

Double spoils handling is necessary to remove the coal in the subject portion of Area E. Dozers, frontend loaders and possibly the dragline would be used to move overburden material away from the active pit area.

After the cut is opened up a coal loading shovel would load the coal into haul trucks for transportation to the crushing and load-out facility. ANFO is used to blast the overburden and coal prior to its removal.

Spoil piles left by the stripping operation are regraded as a continuous part of the mining operation. Regrading takes place within 2 spoil ridges of the pit being worked except where haulage or ramp roads are located.

The sequence of successive parallel cuts running northwest to southeast (figure 2) would advance into deeper overburden. Based upon the market value of the coal in relation to the cost of conducting the mining operation and removing the overburden, WECo indicates that mining would cease at a given point, thus leaving a final highwall. This highwall would then be reduced with dozers to a grade not to exceed 3:1. The spoil piles adjacent to the final pit would be sloped into the highwall reduction zone leaving a 5:1 slope or less throughout the interior spoils. Finally, topsoil would be distributed on these slopes with scrapers and the area would be reseeded.

VI. IMPACTS ON PHYSICAL ENVIRONMENT

A. Topography

The topography of the Colstrip area is largely determined by differential resistance to erosion of the geologic strata. Area E is bounded on the north and east sides by old Northern Pacific orphan spoils and by a standing highwall. Many of the spoils have been regraded. Mining will remove the highwall.

The remaining area between the spoils and federally assisted secondary highway 315 is gently sloping from about 3,300 feet in the north to about 3,400 feet in the south with several hills rising to 3,500 feet or more.

The post mining contour map shows that this area will be leveled to low rolling hills.[6/]

B. Soils

The soils of Area E have been described and analytical data provided in the original 1973 permit application that WECo submitted.[7/] It should be pointed out that such data are somewhat deficient according to current DSL guidelines in that electrical conductivity (EC) was based on a 1:2 soil to water extract which results in values whose relationship to those based on a saturation extract is not predictable. In addition, only a few samples were analyzed for SAR, although ammonium acetate extractable sodium was determined. Nevertheless, no real problem with regard to EC or exchangeable sodium content was evident.

Almost all of the soil types in the proposed mining area have material suitable for discrete salvage. The soils overall tend to be fairly coarse-textured with resultant low water and nutrient storage capacities. The surface or A horizon soil thus assumes paramount importance with respect to these characteristics, due to the fact that the organic matter contents are highest here and therefore the most favorable nutrient and water capacity characteristics would be expected to reside in the surface layers. It is thus desirable to prevent destruction of the surface horizons by salvaging them separately from subsoils.

The stripping operation should be co-ordinated with re-distribution on regraded areas so that only a minimum amount of stockpiling or none at all would be necessary. This would be essential to prevent possible deterioration of A horizon material by anaerobic processes and the loss of natural seed or other plant reproductive structures. Any necessary stockpiles of A horizon material should be left in a shallow configuration and for as short a time as possible. WECo has formulated a plan for separate salvage of A horizon material in areas A and B at the request of DSL. It would be desirable to implement this plan when salvaging topsoil in Area E (see Appendix B).

C. Geology (overburden)

The chemical and physical characteristics of overburden is presented in appendix D of WECo's application for an Area E permit amendment.[6/]

Three overburden holes (N47000, E65000; N46000, E66500; N47850, E59150) are characterized by very high salinity values (ranging from 13 to 28 mmhos) in the top 20-30 feet. Because sampling of this material was based on 5 or 10 foot composite samples, it was not possible to determine the vertical extent of these saline conditions in strippable topsoil. As a result, DSL requested WECo to initiate additional sampling in the topsoil at locations 150 feet distant from each of these drill holes. The depth increments of this sampling will vary from 6 inches to 3 feet. Thus a more precise picture of the occurrence and of the vertical and horizontal distribution of these highly saline conditions in otherwise salvageable topsoil will be obtained.

A highly saline interval (56-65 feet) also exists just above the Rosebud seam in and around hole N47000, E65000. DSL will either require that this material along with that described relative to the three drill holes (above) be buried below 8 feet or it will require that other procedures be taken to insure that this material does not end up on the surface in an intact state.

Hole N47850, E59150 is characterized by greater than 40% clay in the 15 feet of material immediately above the Rosebud seam. Although this hole is located in an area not presently being applied for as mining level disturbance, DSL will require that this material is also disposed of in the manner described above in the event WECo ever mines this area.

The stripping and replacement of overburden in mined out areas necessarily causes changes in its physical characteristics.[5/] Overburden commonly swells in volume by 20-30% during a mining operation as expressed by increased porosity. Possible effects include increased permeability - to both groundwater and surface runoff - and land subsidence as the regraded spoil gradually compacts.

D. Climate

The climate of the Colstrip area is discussed in DSL's final EIS for WECo's proposed expansion of the Rosebud Mine into Area B[5/] (July, 1976). This section of the final EIS (p. 9-17 and Appendix A) is incorporated by reference into this PER.

Dust from coal mining operations at Colstrip may become condensation nuclei if the particles are hygroscopic and if there is water vapor available for condensation. Such nuclei may increase precipitation on the windward side of the dust source.

Blackening of the ground surface with coal dust causes the ground to heat faster and to retain heat longer (Albedo effect). This could cause changes in diurnal air temperature variation as the blackened areas would be hotter than surrounding areas thus causing convective thermal updrafts to occur. Such updrafts could affect local wind patterns and upper level stability.

Regional and long-term effects of the addition of coal dust to the earth's surface are only speculative at this time.

E. Air Quality

The air quality of the Colstrip area has been discussed many times - most recently in DSL's final EIS for the expansion of WECo's mine in Area B (p. 18-36 and p. 11).[5/]

Until vegetation is reestablished on the spoils areas, large areas of soils materials will be exposed to wind and water erosion. Revegetation on such sites will be undertaken as soon as practicable.

Increasing particulate concentrations in ambient air are believed to result in health problems to human populations. There are, of course, all degrees of exposure and the individual's susceptibility will vary. In areas outside of the town of Colstrip, the impact of particulates upon the ecosystem are hard to define. Particularly for coal dust, the lack of knowledge concerning environmental effects leaves numerous questions unanswered:[5/]

1. The deposition of black dust might cause increased temperatures on the surfaces of vegetation, soils and surface waters during periods of solar radiation - the black body (albedo) effect. Similarly, the long term deposition of dust might create more permanent thermal changes in the ecosystem the results of which are speculative (see Section on vegetation impacts).

2. There are also unknowns with regard to the relationship between dust accumulations and the amount of trace elements on foliage. Would coal dust on forage result in detrimental accumulation of trace elements in grazing animals? Would long term accumulations result in eventual passage and accumulation of toxic elements in the local food chain?

The size of air borne particulates of both soil and coal may determine the potential environmental impact. Particulates of very small diameter in greater than normal concentrations may find their way into critical biological locations such that malfunctions result. For example, small particulates might enter plant stomata or the respiratory tracts of pollinating insects.

Cumulative impact on the air quality in the Colstrip vicinity resulting from the simultaneous operation of several strip mine sites, 2 or more electric generation plants, block farming, and natural air degradation factors is yet to be determined.

WECo is engaged in two primary efforts to reduce particulate emissions from mine related activities:[5/]

a. Water trucks are used to reduce dust emissions from haul road surfaces. To date the Department feels that the watering of haul roads has not been frequent enough to adequately suppress dust.

b. The company is engaged in an active program to revegetate mining disturbances. Revegetation of mining disturbances is subject to numerous climatic and operational variables which result in the exposure of vast areas to wind erosion.

In a supplement A to the Permit DSL recently issued to WECo for Area B (August 27, 1976), it was required that an air quality network be installed in locations as approved by DSL (see Appendix B). Such sites will be periodically monitored by DSL and the Montana Department of Health and Environmental Sciences Air Quality Bureau. Specifics regarding air monitoring system are found in DSL's July 6, 1976 "orders of the Department" to WECo and in WECo's October 1, 1976 response to the above mentioned supplement A (see Appendices B and C).

F. Water Quality and Quantity

Van Voast and Hedges in their 1974 report entitled: "Hydrology of Western Energy Co.'s probable mine areas near Colstrip, southeastern Montana"[8/] report that:

1. Significant aquifers within 600 feet of the surface near Colstrip are deposits of alluvium along Rosebud Creek and East Fork Armell's Creek, beds of coal and sand in the Tongue River Member of the Fort Union Formation, and beds of sand in the Tullock Member of the Fort Union Formation.
2. After reclamation premining flow patterns should re-establish themselves.
3. The chemical quality of the ground water will be as variable as that found in present spoils.
4. Mining of the Rosebud Coal in the southern end of Area E has thus far encountered little water and no surface discharges of pit water have been made.
5. Ground water inflow to the pit in Area E would increase if the McKay Coal were mined. Mining of the McKay Coal would increase pit inflows and probably lead to discharges from the mine. Excessive volumes of pit inflows are not expected however due to the low transmissivity of the McKay Coal.

Dissolved solids concentrations from most mine areas will be less than 2,000 mg/l. Higher concentrations may occur in effluent from the northeast end of Area E because of induced flow from old Rosebud mine spoils where dissolved solids concentration may approach 3,000 mg/l.

Van Voast and Hedges in their 1976 report entitled: "Hydrogeologic conditions and projections related to mining near Colstrip, southeastern Montana"[8/] report that:

1. The capability of predicting mining and post mining conditions with much precision have not been developed; hydraulic reactions are not difficult to predict or understand but to quantify them is tough. To predict the outcome of water quality with mining is far more difficult.
2. It is a certainty that water heads or hydrostatic pressures will decline because of increased, reversed, or interrupted hydraulic gradients.
3. Under some circumstances, vertical flow can occur from aquifers below the mining level due to reduced pressures in the aquifers above.

The cumulative impact of concurrent mine operations, as presently proposed at Areas B, A, and E and at the Big Sky mine (Peabody Coal Company) will be to establish localized "groundwater sinks" into each pit and to decrease groundwater flow in some sections.[5/] Hydraulic gradients may be steepened or reversed in some cases as flow is directed towards the pits.

VII. IMPACTS ON THE BIOLOGICAL ENVIRONMENT

A. Terrestrial and Aquatic Life

Mule deer are abundant in the Colstrip area and are often observed in the vicinity of mining activity. Mule deer productivity on the Colstrip 10x20 mile wildlife survey increased considerably from 1973 to 1974 and slightly increased from 1974 to 1975.[10/] Fawn:adult ratios for January, 1975 were 60:100, and for March, 1975 were 40:100. The fawn:doe ratios for September, October, and November, 1975 were 68:100.

The Colstrip 10x20 mile wildlife survey for 1975 shows no sightings of mule deer in Area E;[10/] some mule deer habitat will be disturbed by the proposed new mining activity in Area E as mule deer have been recently and frequently observed in the "orphaned" Burlington Northern spoils.

Antelope were sighted in Area E in the Colstrip 10x20 mile report; further habitat disruptions would therefore be expected to occur as new areas are mined.

Raptors commonly observed in the Colstrip vicinity include golden eagles, marsh hawks, rough-legged hawks, red-tailed hawks and American kestrels. Great horned owls are commonly observed. Mining would cause some loss of feeding areas. No nests are known to exist in the proposed amendment area, so no impacts on nesting sites are expected.

Nongame species would be impacted primarily by the loss of habitat. During the mining process, 343 acres of small-mammal habitat would be destroyed as plant cover is removed. Such habitat loss would lead to at least a temporary decline in primary consumers (rabbits, mice, voles, ground squirrels). Mining operations would decrease available nesting and feeding areas for many of the resident song and insectivorous birds.

Rattlesnakes have occasionally been observed in the Colstrip area and it is possible they occur in Area E. Various aquatic species occur in some of the ponds among the orphan spoils but this proposed amendment will not affect these species.

B. Vegetation

Kuchler described the Colstrip area as an eastern ponderosa pine formation[11/] subsequent site specific studies by Sindelar[12/] and Environmental Consulting Service[13/] have described 7 and 20 vegetation community types, respectively.

The most dramatic and critical impact on the vegetation in the Area E amendment site would be its destruction by mining. On all areas from which the topsoil is stripped, the vegetation would be totally eliminated.

Related impacts include the loss of competitive advantage of some deep-rooting plants for a period after mining, and the loss of vegetation diversity for a period after mining.[5/]

Soil and coal dust (air borne particulates) may influence the premining or reclaimed vegetation in the Colstrip area.[5/]

Dust impacts can be separated into three categories:

1. Dust on leaf surfaces will decrease the amount of light a plant receives thus decreasing its photosynthetic ability. This decrease would be particularly important during periods when the plant is under stress such as during seedling establishment, or during drought periods.[5/]
2. Dust on a leaf surface may interfere with digestion of the plant material by cattle. Dust of either type ingested and introduced to the rumen could adversely affect the digestibility of the plant material. There is also the possibility that dust could alter the pH of the rumen resulting in a change in the rumen flora.[5/]
3. Dust could change the microclimate surrounding the plant. Air borne dust might function as a screen, cutting down on the light received by this plant. Coal dust on or around the plant might have a black body effect raising the ambient soil and foliar surface temperatures. Both dusts also could negatively alter the topsoil in which the plant grows by introducing new chemical constituents. Particulate from overburden and coal may introduce trace elements to the soil and ultimately to the plant. Eventual toxicity could result, particularly from coal dust in which the levels of fluorides and metallic ions are high.[5/]

If the Area E amended permit is granted, additional native vegetation in the Colstrip area will be destroyed, more natural diversity will be lost, and the tendency towards a vegetative monoculture will be increased. In addition, new acreage will have been removed from existing or potential small grain and livestock production at least in the short run.5/

By mining more acreage, the ultimate reclamation success of the Colstrip area becomes more critical. The utlimate success of reclamation in the area will be determined over the next several years. It is likely that the entire Colstrip environment is being modified to some degree due to micro-climatic changes. Such changes are caused by the loss of vegetation and changes resulting from the existing electrical generation plants. The size of the area influenced by the power plants both existing and proposed, is yet to be defined.

VIII. IMPACT ON THE HUMAN ENVIRONMENT

Socio-economic impacts of coal mining in the Colstrip area have been extensively discussed in DSL's recently distributed final EIS for Area B5/ and the reader is referred to that report for a more thorough discussion (p. 117-121).

A. Employment

WECo has indicated that approval of this proposed permit amendment will not add to the current Rosebud Mine work force. WECo also states that the granting of this permit amendment for Area E will prevent the lay off of employees in Mining Area E until such time as the next mine expansion is required.14/

B. Social and Cultural

Area E mine employees are for the most part already residents of the Colstrip-Forsyth vicinity. There should therefore be little or no new social or cultural impacts on these communities as a result of the proposed mine expansion. Miners whose jobs are long-term tend to adopt local attitudes towards the land and people after several years residence.[5/]

C. Housing

Earlier this year, housing at Colstrip was in short supply. However, since the recent lay off of construction workers at the Colstrip electrogenerating units 1 and 2 sites, housing has become more available.[14/]

Housing will undoubtedly become a problem again in the near future when construction begins on units 3 and 4 of the Colstrip electric generation plant.

D. Transportation

State highway 315 is in poor condition and inadequate for the traffic it carries. Granting this permit should not increase the traffic on this road however.

E. Taxes

Area E of WECo's Rosebud Mine provides considerable income to the State of Montana and to Rosebud County in the form of tax revenues. Table 1, below gives estimates of the taxes accrued in 1976 from the Area E coal production. These sums are payable in current and future periods.

Table 1 - Estimated 1976 Accrued Taxes - Area E, Rosebud Mine[a]

Resource Indemnity[b]	Property[c]	Severance[d]	Gross Proceeds[e]	Total
$ 15,000	$ 27,000	$ 932,000	$ 154,000	$1,128,000

a. Estimates provided by WECo, September 29, 1976, based on 968,000 tons of coal.
b. To the State.
c. Mostly to the county, as a rule of thumb, 98% of all property taxes go to local government.

d. The new coal severance tax, effective July 1, 1975, provides revenue for the state general fund and to eight other funds.
e. Basically a property tax to the county.

Granting of this permit amendment by DSL would help maintain the flow of Rosebud Mine tax revenues to Rosebud County and to the State of Montana.

F. Aesthetics

Strip mining operations are very visible in the Colstrip area. This area has, in fact, had spoils piles and a standing highwall for in excess of 40 years.

The aesthetic impact of strip mines in general and Colstrip in particular varies from individual to individual and is dependent upon such variables as ones background, occupation, and personal values, etc. The eventual regrading, recontouring and revegetation of the proposed amendment area should recreate a visual effect of low rolling hills.

G. Historical and Archaeological

There are no known historical or archaeological sites in the proposed amendment area. This area has been bonded in the past as associated disturbance and therefore is somewhat disturbed already. If any historical or archaeological sites are found they will be given appropriate protection.[6/]

H. Unique, Endangered or Fragile Resources

DSL has determined that the amendment area does not possess special, exceptional, critical or unique characteristics as defined in Section 9(2) of the Montana Strip and Underground Mine Reclamation Act.

IX. INDIVIDUALS CONTRIBUTING TO PER

A. Montana Department of State Lands

Bishop, Mike - Hydrologist
Hayden, Brace - Environmental Coordinator
Harrington, Neil - Soil Scientist
Vorozlichak, JoAnn E. - Assistant Environmental Coordinator

B. Western Energy Company

Mike Grende - Permit Supervisor

The assistance of Ms. Ann Jensen and Ms. Linda Wareham, typists, is gratefully appreciated.

X. REFERENCES CITED

1. Montana Department of State Lands, November 21, 1973 Draft Environmental Impact Statement, Administrative Action, Proposed Approval of a Strip Mining Permit for the Continuation of Western Energy's Rosebud Mine at Colstrip, Montana.

2. Montana Department of State Lands, May 13, 1974 Negative Declaration: Proposed Approval of Western Energy Co.'s Mining Plan for Area E-1.

3. Montana Department of State Lands, June 27, 1974 Negative Declaration: Amendment to Western Energy Co.'s Surface Mining Permit #00003: Pit 6 Extension: Area E-1 Access.

4. Montana Department of State Lands, February 20, 1975: Environmental Assessment: Amend Western Energy Co.'s Surface Mining Permit No. 74003 to Include an Additional 225.5 Acres in Area E-2 and Pit 6.

5. Montana Department of State Lands, July 26, 1976, Final Environmental Impact Statement for the Proposed Expansion of Western Energy Co.'s Rosebud Mine into Area B.

6. Western Energy Co., March 5, 1976, Application for Amendment to Western Energy Co.'s Surface Mining Permits No. 73003 and 74003, Butte, Montana.

7. Western Energy Co., October 15, 1973, Montana Strip Mining Permit Application prepared by Westinghouse Environmental Systems Department, Pittsburgh, PA.

8. Van Voast, W. A. and Hedges, R. B., 1974, Hydrology of Western Energy Co.'s Probable Mine Areas hear Colstrip, southeastern Montana, Montana Bureau of Mines and Geology Open-file report Butte, Billings, Montana.

9. Van Voast, W. A. and Hedges, R. B., June, 1976, Hydrologeologic conditions and Projections related to Mining Near Colstrip, southeastern Montana: Montana Bureau of Mines and Geology Open-file report Butte, Billings, Montana.

10. Ecological Consulting Service, 1975, The Montana Power Company Colstrip 10x20 area - Wildlife and Wildlife Habitat Annual Monitoring Report, Helena, Montana.

11. Kuchler, A. W., 1964, Potential Natural Vegetation of the Conterminous United States, American Geological Society, Special Publication No. 36.

12. Sindelar, B. W., Range Type and Productivity of Two Study Areas in southeastern Montana, Montana Agricultural Experiment Station, Bozeman, Montana.

13. Ecological Consulting Service, 1975, Western Energy Company Vegetation Production, Condition and Community Typing, Mining Areas A, B and E, Helena, Montana.

14. Grende, Michael R., June, 1976, Permit Supervisor, Western Energy Co., Personal Communication.

Appendix A

Letter from DSL to WECo
indicating the
Deficiencies in WECo's Area E Amendment Application

June 16, 1976

Western Energy Company
40 East Broadway
Butte, Montana 59701

Attention Mr. Mike Grende

RE: Area E Application for
Permit 00032

Dear Mike:

The Department has completed review of the Area E application for surface mining of coal in the Colstrip area. The application is considered "not complete" at this time.

1) The area of unleased federal coal which lies within Section 2 creates problems with this application which must be addressed. An alternate mining plan must be submitted explaining the operations in the event the federal lease is not obtained plus a narrative detailing how the operations will couple with the ongoing operations once the lease is obtained. The alternate mining plan must also reflect alternate contours and alternate drainage plans if the federal lease is not granted.

The Department has received a letter from Mr. Edwin Zaidlicz, State Director of the Bureau of Land Management objecting to any operations over non-leased federal coal which involve the displacement of overburden. Until such lease is approved, the permit will not allow removal of overburden or topsoil.

2) The exhibit D "Post mining Contour Map" is in error. In the southwestern portion of the area, a 3000' contour line is missing. It is impossible to evaluate drainage in this area. Drainageways leaving the recontoured area do not tie in with existing drainages. Exhibit D should be redrawn so that surface drainage will in fact leave the recontoured area.

A small drainage way, emenating from the bluffs south of the highway, appears to flow over the highwall toward East Fork Armells Creek. The Department has encountered problems in other areas caused by routing the drainage over a highwall. Please address this erosion problem with either less slope, an evaporation dam, or increased channel roughness.

The dam designs proposed in this application appear to be drawn backwards. Please correct this deficiency.

3) The Department has considerable difficulty distinguishing between those activities of Western Energy and those of the "project". The Department requests a clarification of the matter with the understanding that those areas permitted by WECo and disturbances within that area are subject to the reclamation act. Those areas dedicated to "project" activities in the future can be excluded from the permit area if in accordance with the reclamation act.

4) Concerning overburden in Area E, three drill holes indicate extremely high salinity levels in the entire top most 20' - 30' of the column. These holes and soils through which they are drilled are: N47, E65 (Tullock Five Sand Loam); N46, E66.5 (Bainville McKae Loams); and N47.85, E59.15 (Fort Collins). As the overburden analyses were run on 10' composites samples, further samples should be taken to establish the quality of topsoil material around these drill holes. We will also need a commitment to bury the saline overburden within a 1000' radius of each drill hole and to conduct a more concentrated retesting of the regraded-such as one hole/2 acres as called for in tentative guidelines.

Locations from which the topsoil samples will be collected must be mapped. At least two samples, spaced 500' apart and in the same series, should be collected for each hole. Profile sampling procedure should follow the proposed guidelines. Tests to be run are conductivity, Na, Ca, and Mg.

5) The bonding levels as proposed are acceptable. Please include a 10 percent escalator factor in your calculations. Rates are:

mining disturbance = $4067/acre
associated disturbance = $ 200/acre
haulroads and facilities = $3000/acre

6) The areas of thirty year old reclamation experimentation plots located in Area E should be preserved as long as possible. Such areas are very valuable for research and should be protected from disturbance. When will these areas be disturbed by mining under present plans? What means could WECo take to protect these areas until it is absolutely necessary to disturb them?

7) The Department will require a better method of topsoil salvage and must require staking of areas to be salvaged as well as stakes along cuts in the topsoil to show the topsoil salvage depth.

The application is not complete at this time until items 1, 2, and 7 are answered. The other items must be answered before a permit can be issued.

Sincerely,

Richard L. Juntunen, Chief
Strip Mining Bureau
Reclamation Division

dm

xc: Edwin Zaidlicz

VIA REGISTERED MAIL

Appendix B

WECo's Surface Mining Permit and "Supplement A"

for

Area B of the Rosebud Mine

(issued August 27, 1976)

and

WECo's Response to the Supplement A

26-2.10(10)-S10230

SURFACE MINING PERMIT FORM

STATE OF MONTANA

DEPARTMENT OF STATE LANDS

Capitol Building
Helena, Montana 59601
Phone 406/449-2074

Surface Mining Permit No. 76003-A002

Pursuant to Chapter 325, SLM, 1973

This permit when executed by the Commissioner of State Lands shall authorize the operator to commence surface mining activities as specified herein and on maps, plans, specifications and applications submitted by the operator, upon filing of a performance bond as specified by the Board.

Name and Address of Operator

Western Energy Co.
40 East Broadway
Butte, Montana 59701

Legal Description of Mine Location

Section T N/S R E/W County Rosebud

See application data and map

Minerals to be Mined: Coal

Areas to be Disturbed During Next 12 Months:
491 mining
107 haul roads and facilities
577 + 2 associated disturbance

Acres to be Disturbed During Life of Operation Covered by this Permit: 3800

Initial Bond Level (Per Acre)
$4,067/acre mining disturbance
$3,000/roads and facilities and $200/acre associated.

Total Initial Bond Level $2,677,066.70

This permit authorizes the permittee to conduct mining activities as specified in:

1. The Application for Mining Permit Number 00028 received by the Department on September 30, 1975.
2. The mining and reclamation plan numbered 76003-A002 covering this mine or mine complex approved by the Commissioner of State Lands on August 27, 1976.
3. Permit map labeled Exhibit "A" dated July 9, 1976, certified by Michael R. Grende. No mining to occur in Section 10, Township 1 North, Range 41 East until permission is received from appropriate Federal agencies.
4. Supplement A attached hereto and made a part hereof.

This permit and its associated reclamation plan may be modified by the Board, upon proper application of the permittee, at any time during the term of the permit and for any of the following reasons:

1. To modify the requirements so they will not conflict with existing laws;
2. The previously adopted mining and reclamation plan is impossible or impracticable to implement and maintain;
3. The operator and an authorized agent of the Department mutually agree, in the field, to temporarily modify the plan, pending final approval by the Board.

This permit is approved and issued by:

Renewal Date: February 19, 1977

This permit is valid for one year and subject to suspension by non-compliance and may be revoked by order of the Board

Commissioner of State Lands

August 27, 1976
Date

SUPPLEMENT A
Western Energy Company - Strip Mining Permit 76003
Amendment #002

1) Western Energy shall not conduct mining activities in any portion of Section 10, Township 1 North, Range 41 East, MPM, until such time as a lease or other legal authorization is obtained from the proper federal agency which allows mining of the minerals. Mining activities include but are not limited to topsoil salvage and removal of overburden. Associated disturbance and necessary reclamation for leased and permitted section will be allowed in Section 10, including the construction of roads.

2) The map overlays submitted 8/11/76 labelled "Area B Post Mining Topography (Revision)" shall be corrected after consultation with the department.

3) The seismic monitoring program conducted by WECo shall be made available to the DSL for inspection, review and consultation with seismic experts. Data should be made available in support of WECo's permit blasting commitments and evaluations in relation to Colstrip, hwy. 315, wells, and archaeological and natural values.

4) WECo shall submit a plan for approval by the Department to salvage the A horizon topsoil separate from other available topsoiling material.

5) WECo shall submit a plan for procurement and establishment of native seeds and seedlings. The present WECo revegetation plan does not fully address the problem of establishment of diverse species of shrubs and forbs which are presently found in premined areas. The submitted plan should address the problem of past commercial unavailability of some seeds or seedlings and the quantities of seed or seedlings required for revegetation of reclaimed areas and it should put forth a specific revegetation program explaining where and when specific species will be planted on reclaimed areas to provide vegetation diversity. The submitted plan should consider topography, moisture gradient features, species association, exposure, soil types, climatic information and microclimate requirements when developing this revegetation plan.

6) WECo shall investigate and submit a report to the department discussing whether the McKay coal seam could be mined and marketed providing that the layers within the McKay Coal containing objectional qualities were separated and buried. Blending of the selectively mined McKay coal with the Rosebud coal should also be addressed.

7) WECo shall submit to DSL a program of "subsidence monitoring" on regraded and retopsoiled areas in Area B. This program shall call for survey points on reclaimed areas in order to monitor mined areas for subsidence activity. This program should address specific problems in drainage ways and along highwalls where past problems with subsidence have occurred in the WECo Pit 6 area.

8) The fill over, E. Fork Armells Creek, for dragline and other equipment movement shall be removed from the drainage as soon as the eastern end of Area B mining is concluded or as otherwise determined by the Department. When reclamation occurs, all fill, culverts and debris shall be removed and the disturbed area totally reclaimed. During the fill, placement into the channel and subsequent removal; all activities shall be conducted so as to minimize damage to areas within the corridor and outside of the actual fill area. A program of special seeding and transplanting of tree and shrub species eliminated during fill placement, shall be submitted to the department.

9) An air quality monitoring network shall be installed in locations as approved; it will be periodically monitored by DSL and the Air Quality Bureau of the Department of Health.

10) There appears to be some discrepancy between drill hole analyses of WECo and those of Dr. Doug Pollhopf, as found in his spoil handling research, in respect to Mo concentrations; the latter being substantially higher than the former. WECo shall investigate these differences and report to DSL on their findings.

Items #2, 3, 5, 6, 7, and 8, shall be submitted to the Department not later than 10/27/76. Item #1 shall be effective immediately. Items #4 and 10 shall be submitted to the Department no later than 10/1/76. Item 9 shall be installed and functioning by 10/1/76.

Leo Berry, Jr., Acting Commissioner
Department of State Lands

August 27, 1976
Date

THE GREAT SEAL OF THE STATE OF MONTANA

DEPARTMENT OF STATE LANDS

STATE CAPITOL HELENA 59601 (406) 449-2074

STATE BOARD OF LAND COMMISSIONERS
THOMAS L. JUDGE
GOVERNOR
DOLORES COLBURG
SUPT OF PUBLIC INSTRUCTION
FRANK MURRAY
SECRETARY OF STATE
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ATTORNEY GENERAL
E. V. "SONNY" OMHOLT
AUDITOR

TED SCHWINDEN
COMMISSIONER

SCHOOL LANDS

A RESOURCE FOR THE PRESENT
AN OPPORTUNITY FOR THE FUTURE

August 27, 1976

Western Energy Company
40 East Broadway
Butte MT 59701

ATTENTION Mike Grende

Re: 220 approval, Area B

Dear Mr. Grende:

The Strip Mining Plan pursuant to Title 50, Chapter 14, R.C.M. 1947, entitled "The Strip Mined Coal Conservation Act" is hereby approved for the Rosebud coal seam in Area B.

This approval is granted with the following conditions:

1. Western Energy Company conduct the operation so as not to exclude the possible mining of the McKay seam. The Department has been informed by Western Energy Company that, through the Company's marketing endeavors, the McKay seam may be suitable for sale. Western Energy Company shall continue to keep the Department informed concerning attempts to market the McKay coal.

2. Approximately 97% of the Rosebud coal seam will be loaded-out. Only 2% or less of the coal will be left as a wedge to hold the old Burlington Northern spoils. Approximately 1% of the coal will be lost as clearings.

This approved strip mining plan issued in accordance with the terms stated above shall be in effect for one (1) year from the date listed below.

LEO BERRY, JR., Acting Commissioner

August 27, 1976
DATE

jw

'76 OCT [illegible]

WESTERN ENERGY COMPANY

GENERAL OFFICES: 40 EAST BROADWAY, BUTTE, MONTANA 59701

September 30, 1976

Mr. Richard L. Juntunen
Reclamation Division
Department of State Lands
Capital Station
Helena, MT 59601

RE: Supplement A to SMP 76003-A002

Dear Mr. Juntunen:

In response to the above mentioned supplement I would like to submit the following information as required by October 1, 1976:

1) Western will not conduct any topsoil or overburden stripping that would relate to the removal of coal from Section 10, T1N, R41E.

2) Item #4 requests a plan indicating the salvage of the A Horizon topsoil separate of the subsoil material. Attached are two copies of a list showing the soil types and corresponding depth delineations of the topsoil that will be stripped separate of the subsoil. The procedure to be used consists of initially stripping and stockpiling the topsoil in a separate pile from the subsoil in the designated storage areas. Then as regraded spoils are available for immediate topsoil redistribution, the subsoil will go back on first at approximately the same depth and then that material will be covered with approximately the same amount of topsoil. The topsoil layer from the first area of subsoil which will be redistributed will have to be stockpiled. The topsoil survey maps are being revised to reflect the depths to which both layers should be stripped. Two copies will be submitted to the Department upon their completion. Copies will also be submitted to the operation personnel.

3) Item #9 related to the installation of the air monitoring equipment. The equipment just arrived

last week from the factory and it is installed. A representative of the Department of Health and Environmental Sciences is at Colstrip now helping with the calibration of the high volume samplers. As soon as the installation procedures are completed we will start collecting data.

4) A comparison of drill hole analyses from Dr. Doug Dollhopf's report with those analyses presented in Western Energy Company's application for Amendment to Surface Mining Permit Number 74003, reveals that five drillhole locations are common to both studies. Because Dr. Dollhopf used the results from Western Energy's overburden and innerburden analyses for these five holes; the molybdenum concentrations listed in his study are identical to those concentrations listed in Western Energy Company's permit application.

The soil samples from the other 33 holes in Dr. Dollhopf's study area were sent to Montana Testing Laboratory in Great Falls for analysis. The concentrations of molybdenum were determined by use of a method where molybdemun is extracted with Tamm's solution and analyzed on a Plasma Emission Spectrometer.

Same method.

The method used by Northern Testing Laboratories of Billings to determine the molybdenum concentrations in Western Energy Company's soil samples was the Acid Ammonium Oxalate Method. This method Number 74-2, p. 1050-1057 of ASA Agronomy Monograph Number Nine as per DSL Guidelines for testing soil samples.

This difference in testing laboratories and methods could explain a difference in the range of molybdenum concentrations between the two data listings.

Molybdenum concentrations listed for Area B do not reach or exceed the 5ppm level in either Western Energy Company's application or Dollhopf's report on soil analyses. This data should also be reviewed in consideration of the fact that the average molybdenum content of soils in the lithosphere is 2ppm.*

It is expected that sufficient dilution will occur during the normal course of mining activities. However, if the soil testing procedures that are required after

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*Tisdale, Samuel L; Nelson, Werner; Soils Fertility and fertilizer, 1975, McMillan Publishing Co., Inc. New York, p. 322.

> final regrading reveal any areas where molybdenum concentrations exist which have been proven to be detrimental to plant growth; Western Energy Company is committed to bury these areas with at least eight feet of material which is conducive to revegetation.

If the Department has any questions on the above listed information, please do not hesitate to contact me.

Sincerely,

Michael R. Grende

Michael R. Grende
Permits Supervisor

MRG/sa/D:15

CC: Martin White

AREAS A & B

TOPSOIL AND SUBSOIL STRIPPING DEPTHS

MAP SYMBOL	TOPSOIL DEPTH/INCHES	SUBSOIL DEPTH/FEET
Bam	0	0.0
Bat	0	0.0
Ca	6	2.5
Da	6	4.5
Ec	6	3.0
Eb	6	0.5
El	0	1.0
Fa	12	2.0
Fb	6	2.5
Fc	6	2.5
Ha	6	5.0
Hv	6	1.5
Hvg	12	1.0
Ma	12	4.0
Mb	12	4.0
Mc	12	4.0
Mcc	12	4.0
Mt	12	4.0
Rb	6	4.5
Rc	6	4.5
Sa	0	0.0
Sb	0	0.0
Ta	6	0.5
Tb	6	1.5
Tc	6	1.5
Tm	6	0.5
Ts	6	0.5
U	0	0.0

AREAS A & B

TOPSOIL AND SUBSOIL STRIPPING DEPTHS

MAP SYMBOL	TOPSOIL DEPTH/INCHES	SUBSOIL DEPTH/FEET
Bam	0	0.0
Bat	0	0.0
Ca	6	2.5
Da	6	4.5
Ec	6	3.0
Eb	6	0.5
El	0	1.0
Fa	12	2.0
Fb	6	2.5
Fc	6	2.5
Ha	6	5.0
Hv	6	1.5
Hvg	12	1.0
Ma	12	4.0
Mb	12	4.0
Mc	12	4.0
Mcc	12	4.0
Mt	12	4.0
Rb	6	4.5
Rc	6	4.5
Sa	0	0.0
Sb	0	0.0
Ta	6	0.5
Tb	6	1.5
Tc	6	1.5
Tm	6	0.5
Ts	6	0.5
U	0	0.0

Appendix C

DSL's July 8, 1976 "Orders of the Department"

regarding

Air Monitoring Needs for WECo's Areas A and 3

of the

Rosebud Mine

July 8, 1976

Western Energy Company
40 East Broadway
Butte, MT 59701

ATTENTION Mike Grende

ORDERS OF THE DEPARTMENT

RE: Response to Air Quality Bureau letter of July 6, 1976.

Dear Mike:

I spoke with Dave Maughan, Air Quality Bureau, recently and discussed the air monitoring needs of Western Energy's Areas A and B. He related the desire to install the hi-vol samplers as early as possible and asked if the power line could be constructed prior to permit issuance to allow assembly and installation of monitoring equipment. We also discussed the number and location of hi-vol samplers.

It was agreed that seven (7) hi-vol samplers were needed. I believe that Dave discussed the locations of six (6) with Western Energy personnel last week. The seventh hi-vol sampler was deemed to be needed approximately in the center of the SE¼ of the NE¼ of Section 8 immediately south of the railroad loop and load-out facilities. In that six (6) have apparently already been ordered, they should be installed as soon as possible. If there will be a delay in receipt and installation of the seventh hi-vol sampler, the location due west of the highway, (315), and Colstrip in Area A should be the last location to set up a sampler.

It was also agreed that a recording wind system and a national weather service approved recording precipitation device will be needed at or near the approximate location of hi-vol sampler #5. This equipment should be secured and installed as quickly as possible.

Due to the air pollution particulate dust problems present at Colstrip and in and around the mining areas, it has been determined that the Department will require further information in relation to Areas A and B. Therefore, in order to facilitate the gathering of needed air quality parameters at the earliest point in time, the construction of a power line as shown on Western Energy's Area B Mining Plan Map "Exhibit B" certified and received on September 30, 1975, proceeding from the tipple location and running eastward into Area B, is hereby authorized for construction. If installation of air monitoring equipment requires further power line construction please inform the Department prior to construction.

Hi-vol sample sites numbers 1 and 2 are hereby authorized for location within the 100-foot buffer zone if deemed desirable by Air Quality Bureau personnel.

The installation, calibration and data collection should begin as soon as possible. It is Mr. Maughan's understanding that the equipment will be delivered during the week of July 5, 1976. The hi-vol samplers should be gathering data no later than July 21, 1976. Please keep me informed on progress from time to time and any problems encountered.

If you have questions, comments or require further clarification on any matter please contact me at once. Mr. Maughan gave me a map showing the previously discussed locations of air monitoring equipment. If you do not have on contact Dave or myself. Only that construction directly related to the installation of the air quality monitoring systems is authorized and is restricted to the above mentioned map.

Respectfully,

C. C. McCall, Administrator
Reclamation Division

ks

xc: Leo Berry
Alan Joscelyn
Dick Juntunen
Dave Maughan, DHES
Paul Gatzemeier, WECo